Backcountry Weekly Summary

Intern:	Zach Kinler
Week and Year	March 1-7, 2019
Backcountry zone:	Crested Butte Area

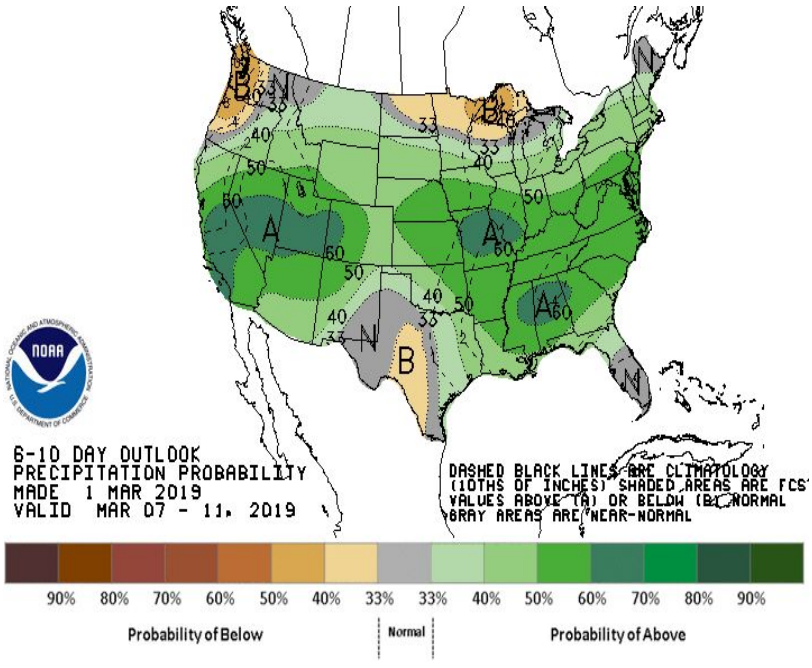
Notable Weather Events (snowfall, SWE, winds, temps, etc.)

Incremental loading is **NOT** a term that will be used to describe this week's snowfall. In the early hours of 3/1, moisture was streaming into CO in westerly flow at the same time an upper level jet-stream approached the area. There was a lack of cold air however these two components came together to kick March off with a bang. On 3/2 a shortwave trough dropped down from the NW and stalled a cold front out just north of our area. Around the same time, a mid-level low joined the party during the day on 3/2 providing large-scale forcing and along with the colder air and moisture and it was on. On 3/3 and 3/4 snowfall continued thanks to a continued moisture tap as well as the convergence of the subtropical jet and polar jet aloft over central CO. When this round cleared we were left with 2-3 ft of snow and up to ~4.5 inches of water.

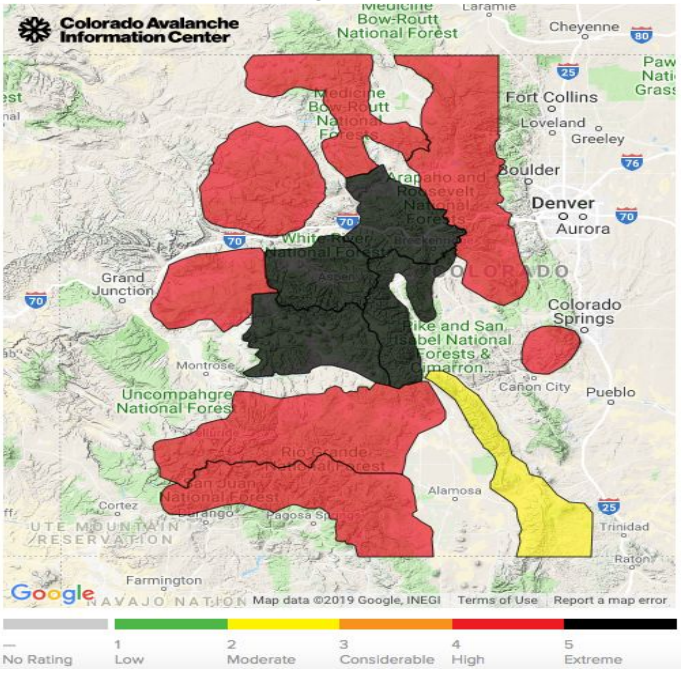
On 3/5 a transitory ridge passed over allowing for a day of rest before the next Atmospheric River entered the picture on 3/6. A deep trough over the west coast began channeling plentiful moisture towards CO once again. Temperatures were very warm in this deep Pacific moisture plume. WSW orographics along with lift from the left exit region of a 110 kt jet stream were able to work on abnormally high amounts of moisture and kick off a 36 hour period of heavy snow and even rain up to ~10,000 ft for a few hours in the late afternoon to early evening. Heavy snow continued overnight and into 3/7 with temperatures staying near or just below freezing. Totals are impressive with this wave and unlike many previous cycles which brought big numbers over several days, this all took place in a day and a half.

These two storms over the past week have combined to give us a historic cycle that may break into the Top 3 of storms since 1986. 5"-11" of water accumulated over 7 days with totals increasing as snowfall continues.

This forecast made on 3/1/19 clearly shows the direct tap of moisture poised to slam the Central Mountains of Colorado.

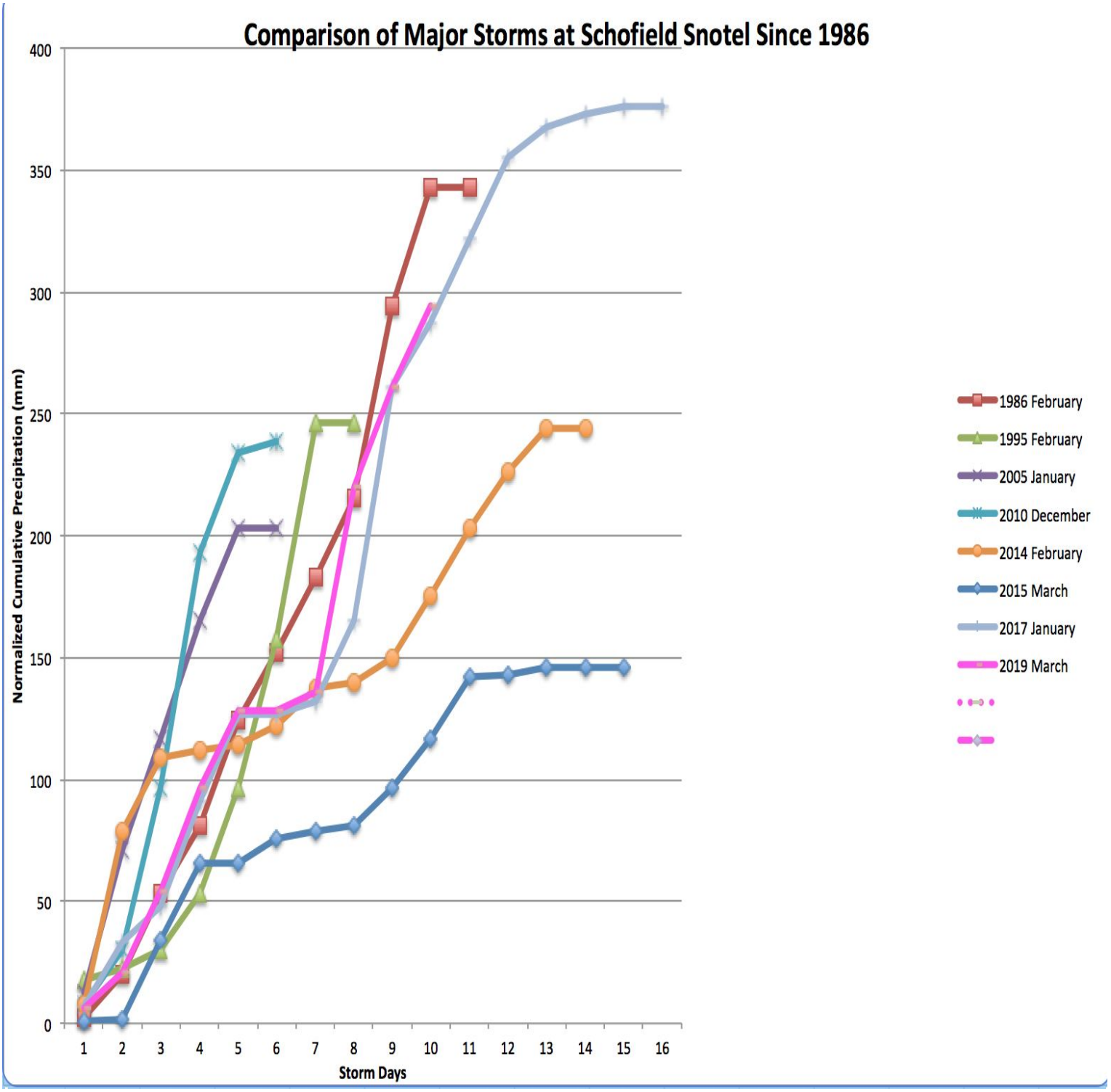


CAIC forecast for 3/7/19 showing EXTREME danger for the Central Mountains including the Gunnison Zone.

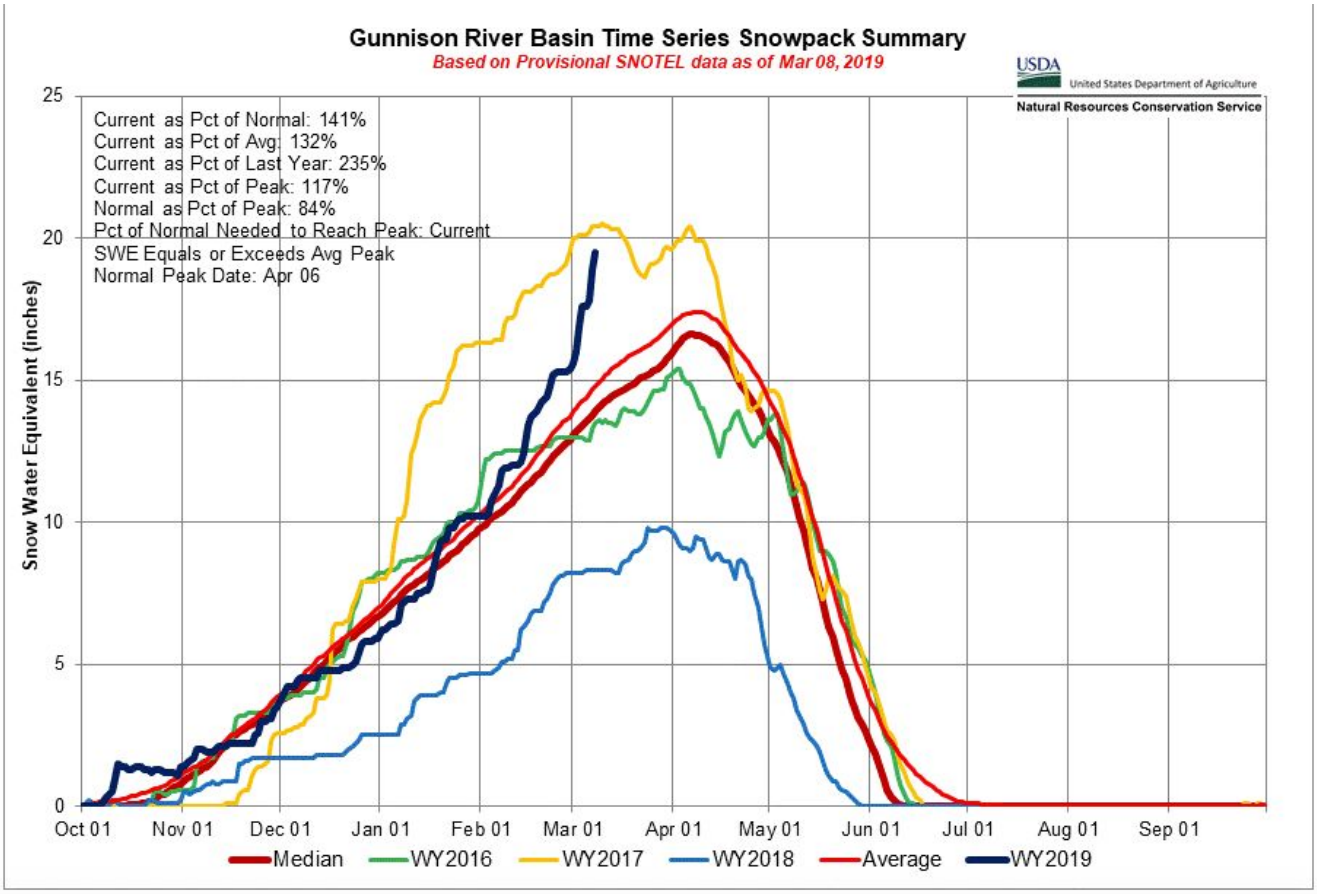


SNOW TOTALS 3/1-3/8

Schofield Pass Snotel: 11.7” SWE/~75” snow
Irwin: 9.45” SWE/ 69” snow
Gothic: 6.28” SWE /65.5” snow
Butte Snotel: 4.9” SWE/~41” snow
Upper Taylor Snotel: 5.9” SWE/~60” snow



Snowpack (weak layer date(s) and status, structure, stability trends)



12/19/2018 Interface: This layer from our mid-December dry spell was unreactive in small and long column tests this week at the study plot. When originally buried, we were dealing with a variety of crust/facet combos on the southerlies with shady aspects having surface hoar down low and near surface facets as you get near and above treeline as seen here: se-s-sw-ntl and afternoon-lap-skook. After the X-mas storm and with SWE amounts on this layer exceeding 1", several D2 avalanches were observed here (p-divide-shaded-treeline-structure and north-below-treeline). After the "Holiday Slabs" came in, we again saw many a small avalanche likely releasing on this layer, especially in the Cement Creek zone. During the avalanche cycle from 1/16-1/24, several very large avalanches on White Mountain and Whetstone likely broke on this layer in the shallower zones near Crested Butte. This interface is still visible in snow pits with varying results in short and long column tests. This Crested Butte area observation revealed a significant slab over this layer with propagating results in a long column test. While less of an issue in our deeper snowpack areas, this interface is still a player, especially in our shallow zones around town and to the East. A couple recent very large avalanches breaking deeply in the snowpack and many step-down avalanches have been failing around this layer. This recent natural activity highlights a couple slides breaking very close to the ground.

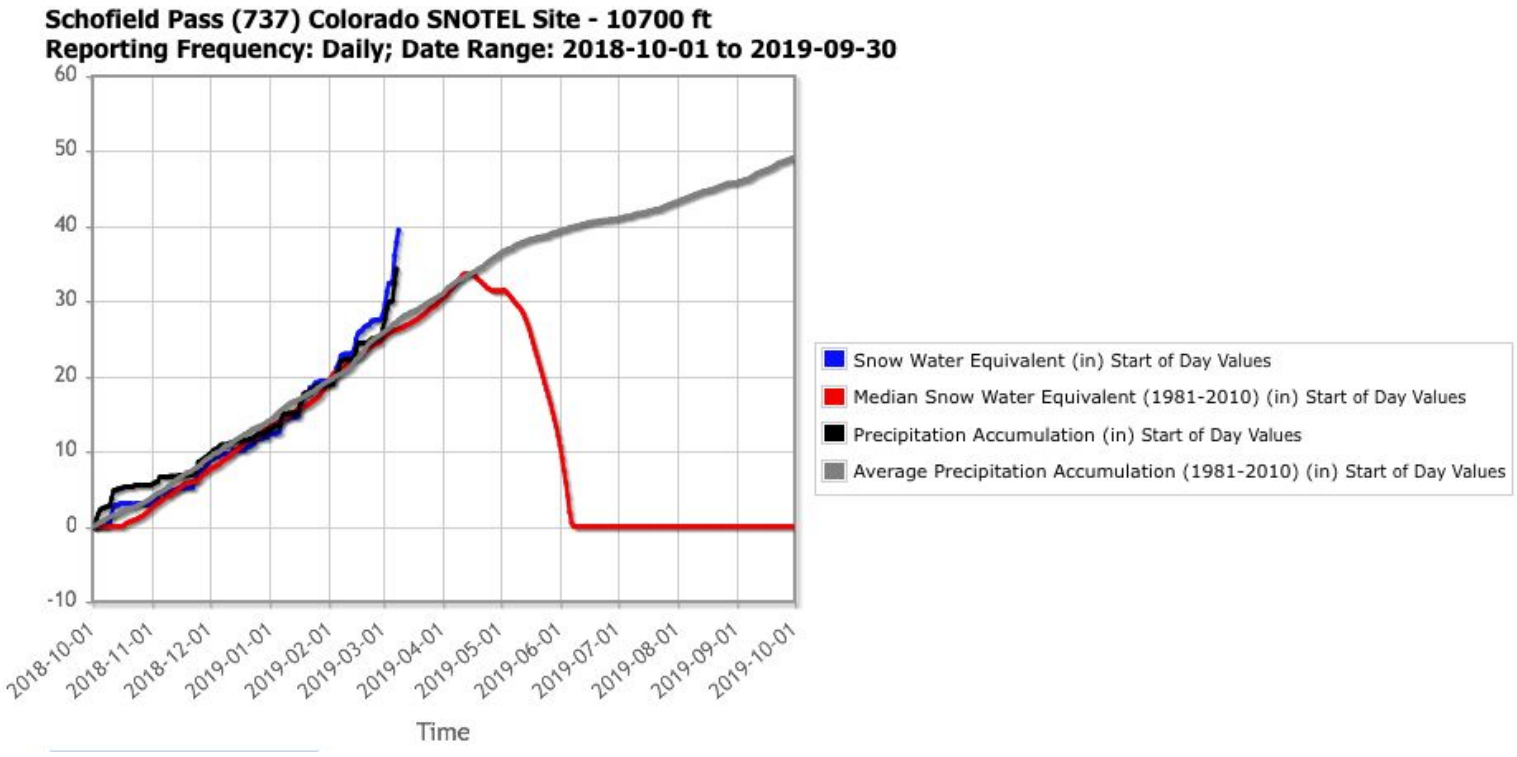
01/15/2019 Interface: This layer formed after the minor accumulations around 1/10-1/12 fell on the weak surface from after 1/06 and was observed as 6 mm SH on a SE aspect @ 11,500, and 3-4 mm SH at the Elkton Study Plot @ 10,400'. Take a look at this observation, surface-obs, from the Paradise Divide area which documents this interface as well. This skier triggered avalanche on a S aspect in the Kebler Pass area ran on this layer, which was a crust, as did this avalanche. Last week in the Crested Butte zone, this layer was observed as SH on top of a crust/facet combo on a SW aspect near treeline and produced propagating results. This interface was involved in a skier triggered avalanche on the South face of Baldy(see "Incidents, accidents and close calls" below). This Kebler Pass zone observation reveals this layer of concern in our deeper zones as does this with Propagating results. Explosives testing got results on this layer last week and future loading will certainly stress this interface. This CBAC observation reveals this layer to be healing in a deeper snowpack as do tests in the Elkton Study plot last week, however in shallower zones it likely has not healed as efficiently and may still be a culprit.

1/21/2019 Interface: Warm days with highs above freezing and cold nights under brief High Pressure following our 1/15-1/18 cycle led to the formation of surface hoar, near-surface facets and crusts depending on aspect/elevation which got buried initially by our “MLK” storm and now sits ~60-80cm deep after the most recent loading. This layer was the culprit in this Elk Creek skier triggered avalanche. This large remote-triggered avalanche occurred a few days later with this interface likely involved. Last week, there were no results on this layer at the Elkton Study Plot and this CBAC observation reveals this layer to be healing in deeper snowpacks but still a potential offender in snowpacks less than 150 cm. Again, recent natural avalanches breaking deeper into the snowpack may be stepping down to this layer.

02/03/2019 Interface: This is our most recent layer of concern and is fairly widespread layer of small near surface facets on shadier aspects and crust/facet combos on sunnier aspects. This layer formed during a period of stable weather with sunny skies, cold nights and warm days after last week’s storm cycle and got buried in the first hours of 2/03 by a storm which came in with widespread graupel making it easy to identify in pit walls. This interface was immediately reactive in pit tests as seen in this Paradise Divide observation. On a South aspect, this layer produced propagating results before the Valentine’s loading as seen here. Last week at the Elkton Study Plot, facets were observed on 2-3 mm graupel particles. No test results were seen however prying of the slab produced planar fractures.

02/16/2019 Interface: This layer formed on 2/15 when skies cleared and late the February sun was able to form a crust on aspects in the sun. This layer is seen on a WSW aspect in this observation from above Pittsburg with small facets forming below. It appears this layer is confined to sunny aspects and could be a player in the future especially with the loading that it has seen this week.

2/28/2019 Interface: The warmest temperatures of the season led to a widespread melt-freeze crust which got buried on 2/28. No faceting was seen yet at the Elkton Study Plot last week, however temperature gradients were very strong under this crust. Time will tell if this will become our next persistent weak layer. With a historic loading event this week, it is likely that avalanches will start running on this new/old interface initially before stepping down to deeper weak layers.



Avalanches


20190303 ob
Whetstone
D3, ATL, NW-N-NE


~3/4/19
Scarp Ridge
North Aspect

Visibility has been very limited with continued snowfall at time of publish and when skies clear we will likely see more historic size avalanches. This week began with 3 very large D3-D4 avalanches breaking on Gothics East side one of which crossed the road and hit a cabin. Climax Chute's debris cloud reached Slate River Road with the main debris burying Mike's Mile nordic trail. Red Lady Bowl released a very large D4 avalanche on 3/6 which propagated ~4,700' across the entire bowl feature and sent debris ~3,000 ft below stopping a few hundred feet short of Kebler Pass trailhead area. Avalanches broke on many aspects and elevations with the largest, most destructive slides breaking in wind drifted alpine terrain. After the second wave of precipitation on 3/6-3/7 where we saw and additional 3"-6" SWE in a short period, the below treeline slopes became overwhelmed and we saw many avalanches releasing below tree line some of which propagated widely through dense forest and took out much of the season's snowpack. It is likely that the Brush Creek and Cement Creek zones saw widespread destructive avalanches with a shallower snowpack laced with weak layers. Historic size avalanches are running throughout the central mountains with a few of these cutting into old growth forests creating new avalanche paths. With continued loading and wind, very large natural avalanches will likely occur into the next period.

This large avalanche in Unemployment Chute ran naturally ~3/6/19 with wide propagation into forested terrain on both sides of the main path. It broke very deeply entraining much of the season's snowpack and trimming trees along the path.

Incident, accidents, close calls

This week, there were no incidents, accidents or close calls reported to the CBAC.

Comments (anything unusual/noteworthy, thoughts on the near future)

This was an incredible week of snowfall and historic avalanches. Upwards of 12” of water fell onto our continental snowpack and the results were impressive not only in our area but seeing historic avalanches clearing old growth forests, burying cars, breaking gas lines and hitting highways throughout the central mountains.

Looking towards next week, a ridge of high pressure tries to establish itself in the Western US while temps remain below normal for this time of year.